



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,381	02/23/2007	Tomohiro Kawamoto	81707.0200	2559
26021	7590	09/16/2010		
Hogan Lovells US LLP 1999 AVENUE OF THE STARS SUITE 1400 LOS ANGELES, CA 90067		EXAMINER HOBAN, MATTHEW E		
		ART UNIT 1793		PAPER NUMBER
		NOTIFICATION DATE 09/16/2010		
		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

LAUSPTO@hhlaw.com  
clifford.keyner@hoganlovells.com  
laura.rivero@hoganlovells.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/580,381	<b>Applicant(s)</b> KAWAMOTO ET AL.
	<b>Examiner</b> Matthew E. Hoban	<b>Art Unit</b> 1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 29 June 2010.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 9,11,13 and 15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 9,11,13 and 15 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement (PTO/US/06)  
 Paper No(s)/Mail Date 2/24/2010
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date: \_\_\_\_\_  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 9, 11, 13, and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims include language "....are treated in an electric field in a no-load state prior to being subjected to the polarization treatment." This language is indefinite as a polarization step is a step where the piezoelectric device is treated under an electric field. These steps define the same process and stating that one occurs before or after the other is confusing and indefinite as no language is given as to separate them. It is unclear how a polarization step can occur on a piezoelectric after it has already been treated under an electric field, as said treatment would necessarily polarize the composition. Thereafter it is unclear as to how claim polarization treatment polarizing an already polarized composition. For this reason, the claims shall be interpreted as the polarization step and the electric field step comprising the same process. In sum, the electric field application step would have a polarizing effect on the sample, so it is unclear as to how a first electric field application step could possibly occur before a polarization step as these two process would occur in the same process.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 9 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Tomoya in JP2003-201174 (machine translation provided, where all citations are relating to this translated copy).

Tomoya teaches a layered piezoelectric composition and a method of making such a composition as can be seen in the Examples (See Paragraph 21 onwards). These layered compositions are made by a process including forming a green sheet, creating an internal electrode with a conductive paste, and repeating this process as needed. Tomoya shows layered compositions having two and three distinct electrode layers (See Paragraph 23). This means that there is both a plurality of internal electrodes and of piezoelectric ceramic layers in the compositions as formed. Finally the composition is calcined, polarized in insulation oil under no load and heat treated as needed. As the composition of Tomoya is poled, it meets the product by process limitations as delineated in the claims. Product by process limitations only necessarily limit the claimed subject matter wherein they produce a material or structural change in the

Art Unit: 1793

product. As the process of Tomoya produces those changes determined, the teachings of Tomoya anticipate the claimed subject matter. The process limitations imposed both pole and create gaps in the layers of the piezoelectric. These two limitations are met by Tomoya as explained below.

The poling of the ceramics would have inherently created the gaps along the interface between the piezoelectric material and the electrode material. This is due to the strain developed at the interface due to the electrostrictive nature of the piezoelectric material. The creation of this gap is recognized at Paragraphs 1 and 2 of exemplary document EP0427901. This document states that the problem associated with stacked piezo/electrode devices with outer electrodes is the formation of such a gap due to tensile stresses developed during the application of an electric field. As Tomoya's device is of this same construction, it would inherently encounter the same gaps being developed along the interface.

The compositions of the piezoelectric ceramic created by Tomoya are shown in Tables 1, 2, 4 and 5. Specifically in these tables, those compositions of interest are found in Tables 4 and 5. The average valency of the B-site was computed for all compositions in Table 4. These average Valences are found in the following tables, where the average valency is found at the bottom of each column with the corresponding example number at the top of the column.

B	Val	49	50	51	52	53	54	55	
Zr		4	46	46.4	46.6	46.8	47	46.4	46.8

Art Unit: 1793

Ti	4	49	49	49	49	49	49	49
Sb	5						0.83	0.83
Nb	5	3.33	3.33	3.33	3.33	3.33	0.83	0.83
Co	2	1.67	1.25	1.04	0.83	0.63	1.67	1.25
Ta	5						0.83	0.83
W	6						0.42	0.42
Avg Val		3.9999	4.0075	4.0113	4.0151	4.0191	3.9991	4.0067
	<b>56</b>	<b>57</b>	<b>58</b>	<b>59</b>	<b>60</b>	<b>61</b>	<b>62</b>	<b>63</b>
	47	47.2	47.5	47	47	47	46.6	46.6
	49	49	49	49	49	49	49	49
	0.83	0.83	0.83	1.25		1.25	1.11	1.67
	0.83	0.83	0.83	1.25	1.25		1.11	1.67
	1.04	0.83	0.63	1.04	1.04	1.04	1.04	1.04
	0.83	0.83	0.83	1.25	1.25	1.25	1.11	
	0.42	0.42	0.42	0.42	0.42			1.67
4.0105	4.0143	4.0223	4.011	4.011	4.011	4.0113	4.0118	4.0118
	<b>65</b>	<b>66</b>	<b>67</b>	<b>68</b>	<b>69</b>	<b>70</b>	<b>71</b>	<b>72</b>
	47.5	46.6	47.5	46	46.4	46.6	46.8	46.8
	49	49	49	49	49	49	49	49
	1.67	1.67	1.67	3.33	3.33	3.33	3.33	3.33
	1.67	1.04	1.04	1.67	1.25	1.05	0.92	0.93
	1.04	1.04	1.67					0.63
	0.83			0.83				
4.0141	4.0118	4.0141	3.9999	4.0075	4.0115	4.0169	4.0171	4.0191

As can be seen from the preceding chart, layered piezoelectric devices of Compositions 50, 55, and 69 have valencies falling squarely in the range of valencies claimed. Therefore, Tomoya anticipated the instantly claimed apparatus of applicant.

***Response to Arguments***

5. Applicant's arguments filed 6/20/10 have been fully considered but they are not persuasive. Applicants explanation of the subject matter of the claims as far as the rejection under USC 112 is not sufficient in overcoming this rejection. The explanation provided is merely a restatement of the claims and does not make said claims anymore definite in nature. It is still unclear as to how the two process steps can occur in the stated order, as the first step would necessarily polarize the composition. Applicants claimed gaps are clearly shown to be inherent based on the process followed by Tomoya, thereafter the arguments as to the novelty of this feature are unconvincing. Applicants arguments against EP0427901 is unclear as they try to delineate a difference between gaps on a plane around the boundary between active and inactive parts vs. a gap between the layers of active material and internal electrode. These are the same layers. The distinction made by applicant thereafter is not convincing. The rejection under Tomoya in view of Chen is withdrawn as it is unclear as to what the method claims actually entail based solely on the fact that with the given subject matter, it is unclear that the method as described is construed properly.

***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E. Hoban whose telephone number is (571) 270-3585. The examiner can normally be reached on Monday - Friday from 7:30 AM to 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Matthew E Hoban/  
Examiner, Art Unit 1793

/C. Melissa Koslow/  
Primary Examiner, Art Unit 1793